



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Hence the area of the required triangle is

$$\frac{\triangle abc[l(m'n''-m''n')+m(n'l''-l'n'')+n(l'm''-l''m')]}{ABC}.$$

Also solved by the Proposer.

315. Proposed by ROBERT E. MORITZ, Ph. D., University of Washington.

Given the area of the segment of a circle of given radius to find the length of the chord.

Solution by G. B. M., ZERR, A. M., Ph. D., 4243 Girard Avenue, Philadelphia, Pa.

I. Let r =radius and $2x$ =the length of the chord. Also let A =arc of segment. Then

$$\frac{1}{3}x[r-\sqrt{(r^2-x^2)}][+\frac{[r-\sqrt{(r^2-x^2)}]^3}{4x}]=A.$$

$$\therefore 169x^5+192r^2x^3-168Arx^2+144(A^2-r^4)x-288Ar^3=0.$$

If A and r are known, x can be found.

II. Let θ =angle of segment at center of circle. Then

$$\frac{1}{2}r^2(\theta-\sin\theta)=A, \quad x=r\sin\frac{1}{2}\theta.$$

By double position θ is found.

$$\text{III. } r^2[\sin^{-1}\frac{x}{r}-\frac{x}{r^2}\sqrt{(r^2-x^2)}]=A. \quad \text{Let } \frac{x}{r}=z.$$

$$\therefore r^2[\sin^{-1}z-z\sqrt{(1-z^2)}]=A.$$

$$\therefore \frac{2}{3}z^3+\frac{1}{5}z^5+\frac{3}{7}z^7+\frac{5}{9}z^9+\dots=A/r^2.$$

By reversion of series z is found, then $x=rz$.

316. Proposed by J. STEWART GIBSON, Department of Physics, Wadleigh High School, New York City.

Determine the locus of the vertices of parabolas described by particles thrown off from the circumference of a uniformly revolving wheel.

I. Solution by the PROPOSER.

Let r =radius of circle, a =velocity of its periphery, ϕ =angular position of particle b at moment of projection, a_v =vertical component of initial velocity, and a_h =horizontal component of initial velocity. Then $a_v=a\cos\phi$. The height, y_1 , to which the particle will rise is (since $h=v^2/2g$),

$$y_1=r\sin\phi+\frac{a^2\cos^2\phi}{2g}. \quad (1)$$